

scapula

Strix brea
La Brea owl

Ventral side
distinct ridge here

as in S. ac. but not *Bubo* or *S. varia*
larger than *Strix varia* or *ac.*

coracoid

Head region dif. than *Bubo* - less well defined
pneumatic foramen on int. side
larger than *S. varia* or *ac.*

specimen	edge of head vent.	head dors.	meas. of corac. for depth head	head length	base of cor.	base of cor.	base of cor.
Bubo	a	b	c	d	e	f	g
584	11.5	7.1	9.1	6.8	51	61.5	75
466	10.0	7.4	9.2	6.4	47.7	74	69.6
166 Bubo	10.4	7.0	8.5	6.3	47.4	67.5	74
Strix varia							
55 Bubo	9.9	5.0	8.2	5.3	48.2	55.5	64.6
Strix varia							
286	9.2	5.2	7.4	4.9	41.2	56.5	64
598	8.5	5.0	7.4	4.7	42	59	63.5
Circus							
63	6.3	3.6	5.2	3.4	30.7	56	65.5
Foris							
E9687	10.7	5.9	8.7	5.7	47.2	53	65.5
H7923	9.9	5.8	7.2	5.4	48.2	58.5	61
H4889	11.0	5.9	8.1	5.8		53.5	63.5

Edge of glenoid facet curved (Bubo straighter,
this slightly concave). Curving similar to *Strix*
Depression around

pneumatic foramen not extending posteriorly so far as in
Bubo or *Ciccaba*, similar to *Strix* & closer to *Varia*,

External side of head region broadly convex -
not as sharply convex as *Strix* (convexity here forming part of a ridge) more like
Chimophaps. *Bubo* is broader than " but has not of mass of center

Scapula cont'd

length ^a breadth ^b or ^c ^d ^e ^f ^g ^h ⁱ ^j ^k ^l ^m ⁿ ^o ^p ^q ^r ^s ^t ^u ^v ^w ^x ^y ^z ^{aa} ^{ab} ^{ac} ^{ad} ^{ae} ^{af} ^{ag} ^{ah} ^{ai} ^{aj} ^{ak} ^{al} ^{am} ^{an} ^{ao} ^{ap} ^{aq} ^{ar} ^{as} ^{at} ^{au} ^{av} ^{aw} ^{ax} ^{ay} ^{az} ^{ba} ^{bb} ^{bc} ^{bd} ^{be} ^{bf} ^{bg} ^{bh} ^{bi} ^{bj} ^{bk} ^{bl} ^{bm} ^{bn} ^{bo} ^{bp} ^{bq} ^{br} ^{bs} ^{bt} ^{bu} ^{bv} ^{bw} ^{bx} ^{by} ^{bz} ^{ca} ^{cb} ^{cc} ^{cd} ^{ce} ^{cf} ^{cg} ^{ch} ^{ci} ^{cj} ^{ck} ^{cl} ^{cm} ^{cn} ^{co} ^{cp} ^{cq} ^{cr} ^{cs} ^{ct} ^{cu} ^{cv} ^{cw} ^{cx} ^{cy} ^{cz} ^{da} ^{db} ^{dc} ^{dd} ^{de} ^{df} ^{dg} ^{dh} ^{di} ^{dj} ^{dk} ^{dl} ^{dm} ^{dn} ^{do} ^{dp} ^{dq} ^{dr} ^{ds} ^{dt} ^{du} ^{dv} ^{dw} ^{dx} ^{dy} ^{dz} ^{ea} ^{eb} ^{ec} ^{ed} ^{ee} ^{ef} ^{eg} ^{eh} ^{ei} ^{ej} ^{ek} ^{el} ^{em} ^{en} ^{eo} ^{ep} ^{eq} ^{er} ^{es} ^{et} ^{eu} ^{ev} ^{ew} ^{ex} ^{ey} ^{ez} ^{fa} ^{fb} ^{fc} ^{fd} ^{fe} ^{ff} ^{fg} ^{fh} ^{fi} ^{fj} ^{fk} ^{fl} ^{fm} ^{fn} ^{fo} ^{fp} ^{fq} ^{fr} ^{fs} ^{ft} ^{fu} 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^{qw} ^{qx} ^{qy} ^{qz} ^{ra} ^{rb} ^{rc} rd ^{re} ^{rf} ^{rg} ^{rh} ^{ri} ^{rj} ^{rk} ^{rl} ^{rm} ^{rn} ^{ro} ^{rp} ^{rq} ^{rr} ^{rs} ^{rt} ^{ru} ^{rv} ^{rw} ^{rx} ^{ry} ^{rz} ^{sa} ^{sb} ^{sc} ^{sd} ^{se} ^{sf} ^{sg} ^{sh} ^{si} ^{sj} ^{sk} ^{sl} sm ^{sn} ^{so} ^{sp} ^{sq} ^{sr} ^{ss} st ^{su} ^{sv} ^{sw} ^{sx} ^{sy} ^{sz} ^{ta} ^{tb} ^{tc} ^{td} ^{te} ^{tf} ^{tg} th ^{ti} ^{tj} ^{tk} ^{tl} tm

Carpometacarpus

~~Similar to Strix and~~
~~just but end~~ ^{But from Bubo in}

the char. of the distal
metacarpal synsphyxis, difficult to
describe but in general thicker through
the proximal portion and ^{with} prox. border cont.
with a ~~short~~ ridge extending ^{a short, dist.} up the shaft on the
post. side; these char. ^{of synsphyxis} similar to Strix tho
the ^{ridge} continuation from the prox. border of the
~~synsphyxis~~ ^{is} present only in S. occidentalis.

Dist. portion of M III seen in post. view slightly
depressed giving flat appearance as in Strix;

^{dist. portion of} M III in Bubo ^{post. view} ~~convex~~ ^{distinctly} ~~measurements~~ ^{shorter max. lengths} of
five specimens, ~~78.1 to 82.2~~ 56.2 to 59.9; smallest
Bubo 60.5 mm.

date	wt		pa	ca	cb
9.8	5.8	4.1	59.2	41.7	70.6
8.7	4.8	3.0	55.2	40.3	73.0
9.0	4.9	3.3	54.4	37.0	62.4
9.3	5.3	3.8	56.9	40.8	71.7

(a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

distance from int. lig. from to
~~top of~~ top of Hæthleon int. and

80 286 48.2 7.9 6.8 12.5 90.5 14.1

"Ratio" "cb" indicates that
the distance between the lip from
to the top of the trachea is greater
in the fossil & varia.
Perhaps end like strix.



22.4 12.7 - 8316

27.4 25.8 - 94.4 ✓

105
B. 2-286

100 286

98

Bulbo

50
Basil

90

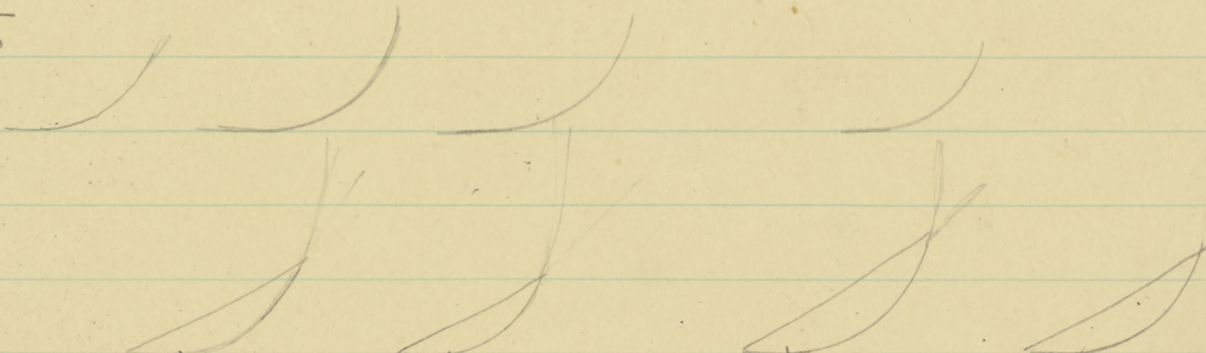
Bulbo
Bulbo

85
12
170
85
10.20

85
33
258
258
28.05

12
33
32
10
4
4
5
100

300
300
600



Remarks: γ

Though in actual size of the individual ^{head & feet} elements the fossil is closer to *Bubo*, in its proportions the resemblance is with *Strix*. ^{the fangs} ~~The tarsometatarsus~~ ^{and femur} ~~are actually longer; in fact~~ ^{the former} ~~exceeds~~ in actual size the modern specimens of *Bubo* available (the not the fossil), the ~~fossil~~. The dif. from *Bubo* is immediately evident upon comparing the tarsi and femora which equal or even exceed the largest specimens of *Bubo* in size with the other limb elements, ^{the coracoid} ~~all of which~~ ^{at least at the extremity} ~~belong~~ to the minimum for that genus, ~~the carpus~~ and humerus being smaller than ~~most~~. Ratios of one element rel. to another indicate close similarity with *Strix* throughout with the exception of the coracoid which appears to be relatively shorter. ~~The tarsometatarsus~~ ^{the tarsometatarsus} agrees with *Strix*, rather than *Siaia* ^{or} *S. varia* differ in the rel. length of tarsus and the fossil agrees with the former.

19.6-20.9

Birds from La Brea

Extremes

Humerus

117.7 - 143

(112.2 - 121.2) smaller humerus

Tibia

117.0 - 133.5

(117.5 - 120) within the nearer min.

Tarsus

61 - 88.9

(63.5 - 68.0) within & nearer maximum

On fossil compared to Birds

Tarsus rel. larger than tibia

" " " " humerus (much more)

Small coracoid?

Tarsus rel to cor. smaller in fossil (yet really reg. size)

tib & hum. rel. to cor. same as Birds (yet really small)

coracoid

56.7 - 49.1

(47.2 - 49.3) smaller

specimen	a length	^{width} breadth across troch- antennae	Breadth at narrow place	height to sagittal recess	height at trochanters	length ant. verte	length pat	ba	cb	dc	eb	da	ca	gl	
Blue	54.5						26.7								
B11	51.9	39.4	19.7	12.4	17.1	27.4	24.7	71.8	50.4	62.6	43.6	23.9	37.9	97.5	
12	51.0	36.2	17.4	11.7	16.2	27.7	23.5	71.0	48.1	66.9	44.7	22.9	34.1	86.5	
66	51.2	36.4	18.1	10.6	16.5	26.9	24.2	71.3	49.7	59.0	45.3	20.7	35.3	89.5	
67	46.9	35.6	17.7	11.4	16.1	28.9	22.4	76.0	49.7	64.1	45.3	24.3	37.8	90.0	
13	53.9	38.3	19.8	12.1	18.0	27.7	26.2	71.1	51.7	61.6	42.0	22.4	36.7	94.5	
466	51.5	38.6	19.5	12.7	17.4	27.2	24.6	75	50.6	65.2	45.1	24.6	37.9	90.5	
84	54.6	39.2	19.6	12.4	18.5	29.3	25.5	71.8	50.1	63.3	47.3	22.7	35.9	87.0	
Ship over 598	44.8	32.3	16.4	9.8	14.9	23.0	21.7	72.0	50.8	59.4	46.1	22.7	36.6	94.3	
451	51.3	30.2	16.0	8.5	12.4	22.3	19.6	73.3	53.0	53.1	42.1	20.6	38.8	88.3	
286	43.1	32.7	16.4	9.6	14.8	23.0	20.8	75.9	50.3	59.4	45.3	22.7	38	90.5	
861	41.7	30.9	15.8	9.2	14.2	22.5	20.2	74.0	51.2	58.2	46.0	22.0	37.9	89.9	
Ship down 55	46.6	34.4	18.4	11.0	16.8	24.0	24.3	71.9	53.8	59.8	48.7	22.9	38.3	900.0	
F1920	50.7	6.5	39.1	20.0	11.6	17.3	26.0	24.2	78.2	51.2	59.0	43.3	23.2	40.0	93.1
E1489	54.0	41.4	—	13.0	20.3	27.3	27.8	76.6	—	—	49.0	24.1	—	100.0	
E3513	50.2	6.9	—	19.9	12.1	—	26.0	24.4	—	—	60.9	—	24.1	39.7	93.9
E9339	55.2	7.2	42.2	20.5	13.8	19.0	28.8	26.2	76.0	48.6	67.4	45.2	25.0	37.1	91.0
E9538	50.7	39.9	19.4	12.7	18.0	26.0	24.6	78.6	48.6	65.5	45.3	25.0	38.3	94.6	
E9774	52.3	6.6	—	20.9	12.4?	—	26.9	25.3	—	—	59.4	—	23.7	40.0	94.2
E9773	57.4	—	20.4	—	—	—	—	—	—	—	—	—	—	35.5	
F9778	53.2	7.3	21.2	13.5	—	—	—	—	—	68.7	—	—	—	39.8	
F4094	50.6	7.0	42.0	21.8	12.8	—	—	82	—	58.4	—	—	—	43.1	
E9648	57.7	—	21.0	13.0	—	—	—	—	—	62.0	—	—	—	36.7	
95417	56.1	—	21.7	14.9	—	—	—	—	—	68.7	—	—	—	38.6	
F4089	57.0	—	21.4	14.4	—	—	—	—	—	67.3	—	—	—	37.6	
F4090	56.7	—	22.0	13.7	—	—	—	—	—	62.4	—	—	—	38.8	

	a length hind foot + vent	b breadth at humerus	c breadth at humerus place	ce	d length hind foot + vent	da	total length	Pelvis Labrum caudal
Bubo 466	26.9	19.5	72.5%	38.7	50.5%			
84	29.2	19.7	69.5					
S. n. 28.6	22.8	16.6	74	32.8	76.2	19.8	43.1	43.1
S. n. 55	24.4	18.4	75	32.7	68.1	23.0	48	
S. n. 451	21.8	16.5	76	30.2	51.5			
E 9774	27.7	21.0	78.5		23.7	87.5%	52.3	
E 9778	25.5	21.1	74					
E 9538	25.3	19.4	76.2	39.9				
F 4094	26.2	21.8	84.0	42	83.3	23.4	50.5	
F 9773	20.1	20.5	69.0		25.8	85.9%	57.4	
E 9446	31.2	21.0	69	41.7			57.8	
F 4090	30.9	21.9	68.5	40.3	24.5		57	
E 9339	28.9	20.8	78.5	42.3	24.6		55.2	
F 4084	29.6	21.4	72.5					
Bubo 13	27.7	19.8	72	38.3	71.0	24.3	53.9	
Bubo 66	26.1	18.3	70%	36.5	20.9			
F 4096	27.5	18.8	68.1					
E 1920	26.1	20.1		29.1	23.8	91.3%	50.0	
E 1515	28.1	19.4		38.2	72.3	23.7	84.4%	52.9
E 1489	27.3			41.3	25.5		53.9	
Bubo 84	29.7	19.6		39.1	24.3		54.6	
466	27.2	19.5		38.6	22.9		51.6	

Thufanus La Brea fossil owl

Prox. end.

Articular surface were deeply excavated just posterior to cranial crest & surface divided here (left) by raised portion separating it from left side (in situ)

Dist. end int. condyle

no.	length	br. prox	br. dist	depth int. cond.	br. int. cond.	depth ext. cond.	br. ext. cond.	ba.	ca	dc	fe	ed	gf
E9758	—	—	13.3	11.1	7.9	10.9	7.0	—	—	83.5	82	71	64
E9888	119.3	13.9	14.2	11.5	8.3	11.5	7.2	11.6	11.9	81	81	72	62.5
E9414	119.0	—	14.0	11.0	8.0	—	7.6	—	11.7	78.5	—	72.5	—
E9932	120.0	13.6	14.4	11.6	8.5	11.2	7.5	11.3	12	79.5	78	73	67
E9267	—	—	11.8	10.1	7.3	—	6.8	—	—	86	—	72	—
E7738	119.5	—	14.4	—	8.8	—	—	—	12.2	—	—	—	—
Shuygan	103.4	12.5	13.2	10.1	7.6	3.8	10.6	6.8	4.4	12.1	12.7	79.6	80.5 72.5 64 56 50 55
Shuygan	98.7	11.5	11.8	9.7	7.4	9.5	6.4	11.6	11.9	82	80.5	76	67.5
286	96.6	11.2	11.8	9.6	7.4	9.3	6.4	11.6	12.2	81.5	79	77	69
Pueblo	146.9	13.7	14.8	12.3	9.3	4.5	11.3	7.3	4.8	11.7	12.6	83	84.5 75.5 64 36.6 42.5 54.6 61.5
66	117.0	13.2	13.1	11.0	8.4	10.6	7.0	11.2	11.2	84	81	75.5	64
84	123.2	14.4	15.1	12.5	9.2	11.8	7.8	11.7	12.2	83	78	73.5	64

Lines tangent to the prox & dist surfaces of the condyles - prox & dist condyles are more nearly parallel in the fossil. On Pueblo the int. condyle rises higher on the shaft than the ext. so that a line drawn across the prox ends of the two is well slanted - forming an arc of 9 to 13° with the line drawn across their dist. ends. The arc in the fossil is from 4 to 7° in size - 3 to 6.

12.4
11.6
11.7
3/35 6/11.8

$$\begin{array}{r}
 19.1 \\
 \hline
 756 \overline{) 1450} \\
 \underline{756} \\
 6940 \\
 \underline{6804} \\
 1340
 \end{array}$$

are = dif. in slant at top & bottom of condyles

Rubro 6B	10°	
84 - 1B		} 9-13
13 - 11		
R 466	9	
E 9932	5°	✓
F 7438	(10)	
E 9414	7	✓
E 9888	6	✓ 4-7
E 9758	6	✓
E 9267	5'	✓
E 1139	5'	✓
F 7456	4	✓
E 9942	6 $\frac{1}{2}$	✓
E 9444	(9 $\frac{1}{2}$)	✓
S. varia	3 $\frac{1}{2}$	
S or, 5'98	5'	} 3-6
S or 286	6'	

Tubia
In Brn and
cont'd

mit. condyle flares more ^{slightly} just ^{near} than ^{anterior}
but less than Rubro, the flare being at the
prox part of the condyle only, while in Rubro it
~~extends across the entire part posterior~~ more
directly posterior & distal.

	a	b	breadth	Depth	Tibio-tarsus LaBucourt			
	length	prox	dist.	dis	ba	ca	da	int. cond.
E 9267	111.7	—	11.8	9.9		10.5	83.9	
E 9888	118.0	13.9	14.2	11.5	11.7	12	81.1	
E 9932	118.6	13.6	14.3	11.5	10.4	12	80.6	
E 9414	118.1	14.0	14.0	10.7		11.8	76.5	
E 9758			14.3	11.2			78.4	
Bubo 9466	115.4	13.7	14.8	12.3	11.8	12.8	83.7	
84	122.3	14.7	15.0	12.8	11.8	12.2	85.4	
Styx 55	102.0	12.6	13.9	10.4	12.3	11.8	78.3	
S. o. 286	95.5	11.2	11.8	10.7	11.7	12.3	70.8	

11.1 7.8

Muscle scars on inside of tibiae are not
do not extend down for whole D shaft as in Bubo
Muscle tub. on int. condyle more anterior &
proximally placed than in Bubo
Tarsus

Muscle scar on ext. side of shaft above dist. end
is centrally placed with ref. to ant. post. direction / thus
similar to Styx & diff. from Bubo (Bubo it is at post. edge)

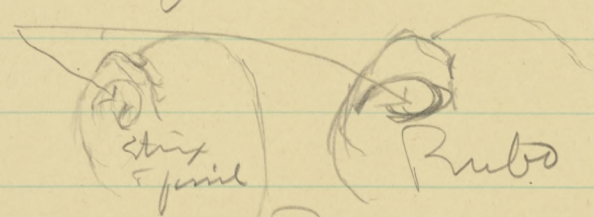
	a	b	breadth	Depth	Tibio-tarsus LaBucourt			
	length	prox	dist.	dis	ba	ca	da	int. cond.
E 9439	75.0	14.5	12.0	—	19.1	83.8	—	
E 9047	76.1	15.4	13.1	15.4	20.2	85.2	20.2	
E 9909	76.0	15.3	12.5	14.8	20.0	81.8	19.3	
F 4884	—	15.7	12.9	—	—	81.0	—	
Styx 598	69.7	14.3	12.9	13.8	20.3	87.6	19.8	
Styx 598	67.1	12.7	10.7	12.2	18.9	84.7	18.1	
Styx 286	65.8	12.5	10.3	12.1	18.0	84.9	18.4	
Styx 410	65.5	12.8	10.6	12.3	19.5	82.8	18.7	
Bubo 13	74.6	16.0	13.2	15.2	21.4	82.5	20.3	
" 466	72.1	15.0	12.9	15.5	20.4	80.1	21.4	
" 84	78.0	16.4	13.4	16.0	21.0	81.8	20.5	

	a	b	c	d	e	f	Measurements						
	length	prox	dist.	br. sh.	dist. sh.	distid	ba	ca	fa	x6	x'6		
E9804	121.2	20.9	19.8	6.7	6.6	5.3	6.8	39.7	17.2	16.3	32.7	25.3	28.7
E9051	112.5	19.6	—	7.5	6.8	—	—	35.8	17.4	—	31.8	—	—
E9425	118.7	19.7	—	7.9	2.0	—	—	39.1	16.6	—	32.9	—	—
various	104.4	19.1	17.9	5.3	6.4	4.0	6.0	32.4	18.2	17.1	31.0	20.9	27.8
oc. 286	100.8	17.4	17.3	5.6	6.6	3.9	5.2	32.5	17.2	17.1	32.2	22.4	32.4

Palmaria side prox end - deeper excavation than
 Bulbo - closer to stria (varia in partimula). A dif. in rep
 of med. crest & pneumatic foramen, etc.

Bulbo 466	122.3	20.6	20.6	6.7	8.1	5.3	7.4	38.2	16.8	16.8	31.2	25.6	32.4
84	130.5	21.6	21.2	7.5	8.2	6.4	7.0	38.7	16.5	16.2	29.8	29.6	34.6
oc. 598	104.0	17.0	17.7	5.8	6.7	5.9	5.3	32.5	16.3	16.6	31.2	22.9	31.1

Pneumatic foramen ~~side~~ higher than broad as in
 stria



Median crest

lower than in Bulbo

Diff. nearer 2 or, than 3, than

	Depth rock	Breadth dist	Depth prof	Breadth prof
G 8431	9.8	9.1		
G 8421			10.2	11.7
G 8426	9.5	9.6	10.2	12.0
G 8427				12.0
Bulbo 84	10.7	10.6	11.5	14.1
B. Nance 55	8.9	8.9	10.1	11.3
S. or 86	8.0	7.6	8.5	10.0
286	8.9	8.7	9.2	10.7
Bulbo 466	10.3	10.3	11.2	13.3

$$\begin{array}{r}
 4.47 \\
 31 \overline{) 136.90} \\
 \underline{124} \\
 129 \\
 \underline{124} \\
 50 \\
 5 5 \\
 8 \overline{) 44.2} \\
 \underline{40} \\
 42 \\
 \underline{40} \\
 20
 \end{array}$$

Mon. May 2

Sat May 28?

Sat. June 4

Thurs. Sat June 9-10, 11

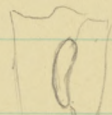


Feb. 20?
27?

page 7

^{Spinos la Bna owl}
Pulsatrix too heavy (moderately Rubo)

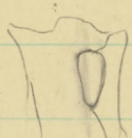
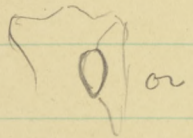
Shape of surface at posterior end of int. cal.
ridge long, narrow and slightly bowed away
from edge of bone



int. side

Rubo is either

egg shaped or if more excavated on one side than the
other the bowing is toward the edge of the bone



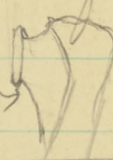
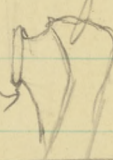
Similar to Strix in this char.

(char. holds for both S. or. & St. varia) (Ciccaba)
Snowy owl very rounded O (like forrie)

Sedriaplex more like Rubo

Pulsatrix something like Strix (but see there has
a part that connects with shaft ^(this surface blends right with the) the int. cal. ridge ^(closer to Rubo but more blended)

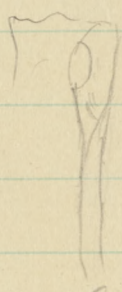
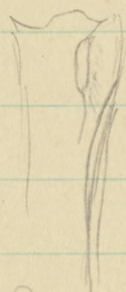
Rhinophytus more like Rubo

This surface sharply defined from ^{distal} portion
of ridge connecting with shaft . More faintly
defined in Rubo. ^{or snowy} Blending with  in in Pulsatrix
Well defined in Sedriaplex, ~~but angle with shaft~~
~~more acute.~~ Soeril similar to Strix.

~~but prox end slightly further post. than dist. so that~~
~~surface slants~~ & a little like Scops after
but there is something diff about the latter - I think
the prox end is further post. in it.

Ciccaba also is similar

int. cal. ridge is noticeably set in away from int. edge of shaft in fossil & Strix but it blends into the edge of the shaft in Bubo



Pulsatrix & Sedidia & Snary like Bubo.
 does edge than Strix
Ciccaba sort of intermed.
Rhinopteryx more like Strix

Shape of external edge of median trochlea:
 more convex posterior in Bubo - sort of flat - "sliced off" appearance in Strix & fossil. Ciccaba flat; Rhinopteryx round; Snary, round; Pulsatrix flat, Sedidia flat

Fossil is of the genus Strix

in the Laurel

Tho the proportions of S. oc. are closer to the fossil than are those of S. varia, the configuration of the anterior side of the shaft is closer in the fossil to varia. (S. oc. is deeply excavated for almost half the depth of the bone - from the prox. end down the tub. for the tib. art. lying in this depression; ~~this~~ the shaft is only faintly depressed in this reg. in varia & the fossil.)

E9379 = type

Strix la-brea
Strix la-brea
Strix brea

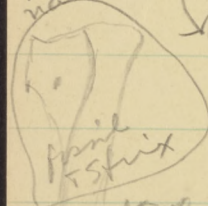
braeensis
la-breaensis
californiensis
Strix braeensis

Publ. Condor 35:166-69
made 1933

Owl from La Brea = Sharp beak

Tarsus: Internal side of proximal end - inside

scapular
distinctly
marked
but not
narrow
marked but
narrow



Pulsating
same as
except not
so narrow
phalangeal

int. calcaneal ridge distinctly excavated
Closed to strip than Bubo in this tho
perhaps more so even than Strix.

Shaft here narrow, curving forward, &
distinctly marked post'ly from calcaneal
ridge. Again closer to Strix (also Ciccaba)
Shaft here & very indistinct post. Border

	length	prox.	dist.	shaft	ba	ca	da	x a
E 9575	65.9	12.8	22.4	15.0	6.8	19.4	22.7	10.3 34.0
G 3933	67.7	14.1	23.0	17.0	7.4	21.0	25.3	11.0 34.2
E 9417	68.0	14.0	22.6	16.8	7.3	20.6	24.5	10.7 33.2
F 5	61.0	13.5	16.3	6.9	22.1	26.7	11.3	
E 9379	67.2	14.3	23.1	16.4	7.2	21.2	24.4	10.7 34.3
G 3957	63.7	12.6	20.9	14.7	6.0	19.8	23.1	9.4 31.8
E 9892	64.9	12.8	22.3	14.8	6.5	19.7	22.8	10.0 34.3
E 9911	66.1	14.0	23.3	16.4	7.2	21.2	24.8	10.8 35.2
E 9416	66.1	13.7	22.5	15.9	7.3	20.7	24.0	11.0 34
G 3973	64.9	14.6	00	7.9	22.5	26.9	12.9	
G 3958	66.7			6.5				
Strix 9	56.0	13.0	18.7	15.4	7.3	23.2	27.5	13.0 33.4
Strix 9	56.8	11.7	17.6	13.4	6.1	20.5	23.5	10.7 *30.9
11 9 286	54.4	11.6	17.6	13.2	5.8	21.7	24.0	10.7 *32.2

Shape of int. calcaneal ridge - doesn't slant so
decidedly upward as Bubo - more like Strix

89580	57.1	14.8	16.4	7.7	25.9	28.1	13.4
28 9429	58.7	15.4	17.3	7.8	26.2	29.2	13.2
S. rufipes	51.0	10.5	5.8		20.4	11.3	
	52.0	12.7					

	a	b	c	d	ba	ca	da
Bubo	length	prox	dist	shaft			
Bi 13	62.1	14.8	17.4	8.2	23.8	28.0	13.1
Bi 66	61.1	13.2	16.1	7.3	21.6	26.3	11.9
Bi 84	63.1	15.8	17.7	8.1	23.4	28.0	12.8
Bi	63.3						

Length	61.0-68.0	12.6-14.6	14.7-16.7	6.0-7.9	19.4	22.8	9.4
Sp. ?					21.2	25.3	11.0

Phainopepla							
758 (miller)	51.4	10.7	13.6	6.3			
Pulsatrix							
710 "	54.7	13.4	16.6	8.8			
17305 (Ortiz)	53.0	13.7	16.6	8.7			

Summit							
883	49.0	14.9	16.9	8.2			

Coccyzus							
16632 (Ortiz)	45.5	9.0	10.6	4.7			

410	6.8-8.3	82.0					
Coccyzus	5.3						
	5.4-6.1	90.0	86.9				
55	8.2-10.2	84.4					
598	6.6	8.0	84.6				
286	6.7-7.9	84.7					
861	6.1-7.6	85.9					
formal	7.9-9.1	86.8					

" carpus - same
 " coracoid - same
 same as both
 same as both (little longer than varia)

Coracoid

with tarsus, shorter

shorter than varia (varia like B)
 very little bit shorter than
 about same as varia
 little shorter than or

" tibia same

" femur shorter

can't fit

" carpus - same

can't fit

same as both
 slightly shorter than varia
 shorter than or.

" humerus - same

same as both

tarsus

with tibia - longer

same tho slightly longer than varia

" femur - longer

same
 longer than varia (not so much as B)
 same as or

" carpus - longer

" humerus - longer

slightly longer

" coracoid - longer

slightly longer

tibia

with tarsus - shorter

same (slightly shorter than varia)
 same as varia
 shorter than or.

" humerus - shorter

" femur - shorter

same

" carpus - longer

" coracoid - same

same
 about same as varia
 slightly longer than or.

femur

with tarsus - shorter

slightly shorter
 same

" tibia - longer

same

" carpus - longer

same

" humerus - longer

same

" coracoid - longer

same

with tarsus - shorter

shorter in varia
 same as or

" tibia - shorter

same

" femur - shorter

same

" humerus - same

same

" coracoid - same

longer

Sen, Br Sabra out

Tarsus tibia femur humerus carpus coracoid

Bubo 61.1-63.1 116.9-123.2 72.1-78.0 122.3-130.5 64.8-68.1 10-11.5 47.4-51.1
 54 103.4 69.9 104.6 52.2 9.5 43.2
 Strix 54.6-56.8 96.6-98.7 65.5-69.1 100.8-104 48.2 8.5-9.2 41.2-42
 Jovialis 63.5-68.0 117.5-120 75.6-76.6 112.5-121.2 56.4-59.9 9.6-11.0 47.2-48.2

	basal		Strix	Strix	Strix	Bubo		
	max. min	<u>Bubo</u> 84	varia	or	548	12286	13	66 466
Tarsus	68.0 63.5	63.1	56	56.8	54.6	62.1	61.1	61.1
tibia	120.0 117.5	123.2	103.4	98.7	96.6	—	117.0	116.9
femur	76.6 76.6	98.0	69.7	67.1	65.5	74.6	72.1	72.1
humerus	121.2 122.4	130.5	104.6	104.0	100.8	129.4	121.6	122.3
carpus	59.9 56.4	65.8	52.2	48.2	48.2	—	—	—
coracoid	49.3 48.2	51.0	43.2	42.0	41.2	—	48.4	47.7
humerus	63.0 63.5	63	67	68	67.5	—	—	59
tibia	56.5 54	51	54	57.5	56.5	—	57	—
carpus	88.7 84	80.8	80.8	83	83	83.3	—	—
coracoid	63.7 67.5	63.3	67.4	68	67.4	—	—	61.6
humerus	49.4 50.1	50.4	49.8	—	47.8	—	—	—
carpus	62.7 62.3	65.4	61.9	62.4	62.8	—	—	66
coracoid	71 74.3	81	77	74	75.5	—	77.6	—
humerus	40 40	41.5	41.5	42.5	42.5	—	40.5	—
carpus	39.6 42	39.1	41.3	40.4	41.7	—	—	39
coracoid	80.5 83.3	77.5	83	85.1	85.5	—	—	—
humerus	56.1 56.4	48.3	58.6	54.6	54.3	48.0	50.3	—

notum 16.1 →



5 9.7
 56.4
 2/11 6.4
 58.2
 20.8-20.4
 9.7-9.2

$$\begin{array}{r} 4 \overline{) 4918} \\ 1229 \end{array}$$

$$\begin{array}{r} 2 \overline{) 2738} \\ 1229 \end{array}$$

$$\begin{array}{r} 621 \\ 649 \\ \hline 2 \overline{) 1270} \\ 635 \end{array}$$

$$\begin{array}{r} 2 \overline{) 129} \\ 645 \end{array}$$

$$\begin{array}{r} 3324 \\ 2950 \\ \hline 6274 \end{array}$$

$$\begin{array}{r} 199.24 \\ 62.74 \\ \hline 136.50 \\ 232.90 \\ \hline 369.40 \\ 232.90 \\ \hline 136.50 \\ 14 \\ \hline 150.40 \end{array}$$

11111
14

$$\begin{array}{r} 105.6 \\ 100 \\ \hline 5.6 \end{array}$$

$$\begin{array}{r} 750 \\ 808 \\ \hline 2 \overline{) 1557} \\ 77.6 \end{array}$$

$$\begin{array}{r} 100.0 \\ 96.6 \\ \hline 3.4 \end{array}$$

$$\begin{array}{r} 1210 \\ 134.6 \\ \hline 2 \overline{) 2556} \\ 127.8 \end{array}$$

$$\begin{array}{r} 136.50 \\ 369.40 \\ 34.74 \\ \hline 334.66 \\ 42.75 \\ \hline 291.91 \\ 7.12 \\ \hline 283.79 \end{array}$$

100 50 8

4 8

MM

	Jussil		Recept		La Brea		S. varia	Stung	
	max	min	max	min	max	min		occidentalis	
<i>Patidocarpus</i>								?	286
tarsus	88.2	88.5	106.0	107.0	102.0	99.1	93.3	88.0	88.3
tibia	49.4	49.8	53.4	52.3	52.5	51.4	50.5	50.6	49.8
femur	75.1	72.7	84.4	84.6	81.8	80.7	74.7	74.5	73.6
humerus	49.3	49.9	50.5	50.3	49.0	48.1	49.8	48.1	47.8
coracoid	124.5	121.5	129.0	128.7	123.8	123.1	121.0	119.0	117.0

humerus	65.0	68.5	59.7	59.3	59.8	59.4	66.6	64.5	65.1
---------	------	------	------	------	------	------	------	------	------

1. Tarsus longer than humerus
 2. Tibia longer than humerus
 3. Femur longer than humerus
 4. Coracoid longer than humerus
 5. Tibia longer than humerus
 6. Tibia longer than humerus
 7. Tibia longer than humerus
 8. Tibia longer than humerus
 9. Tibia longer than humerus
 10. Tibia longer than humerus

tarsus longer

tibia shorter slightly

carpus shorter actually 1 inch

humerus " " " "

cora. " actually 5 legs ex. tibia

femur longer esp. everything but tarsus actually about same

Rec'd	La Brea	Recent	of Bubo	40226	Bubo	Rec'd	Recent
112.7	117.9	116.9	116.9	63.5	61.0	61.1	61.0
120.0	133.8	123.2	133.5	68.0	68.9	63.1	65.9
2) 232.7	251.7	240.1	2) 131.5	2) 129.9	2) 124.2		
116.3	125.8	120.0	65.7	64.9	62.1		

Coracoid

44.2	49.1g	47.4	47.4	112.5	126.0	121.6	121.6
49.3	56.7	51.0	56.7	121.3	143.3	130.5	143.3
2) 93.5	2) 105.8	2) 98.4	2) 123.8	2) 269.3	2) 232.1		
46.7	52.9	49.2	116.9	134.6	121.0		

Femur

77.2	74.9	72.1	72.1	56.2	60.5	61.1	56.9
78.7	85.8	78.0	85.8	59.8	70.3	65.8	70.3
2) 155.9	2) 160.7	2) 150.1	2) 116.1	2) 130.8	2) 126.9		
77.9	80.3	75.0	58.0	65.4	63.4		

Carpometacarpus

Coracoid to Ulna

39.2	41.6	40.6	69.6	80.4	77.6
41.0	42.4	41.3	72.4	82.4	80.8

Coracoid to Tarsus

Cor. to S. B.

min	93.3 (Rec.)	90.0 (La Brea)
max	96.6	86.7
mean	95.2	88.4

Tib of S. & Bubo

96.4 (Rec.)	95.6 (La Brea)
97.6	89.8

93.5% all Bubo

94.9% all Bubo

Tarsus of S. & B.

mean 103% (all Bubo) 3% larger

Humerus of S. & B.

91.6% 8% smaller	
min. 92.6 (Rec.)	89.4 (La Brea)
93.1	84.7

Carpus of S. & B.

mean 89.8% approx. 10% smaller
94.6 (La Brea)
max 85.3

Tarsus of S. & B.
= 100%

cora-tarsus coracoid shorter - tarsus longer (= S. oc.)
 " tibia coracoid same in all - tibia same in all
 " femur coracoid shorter - femur longer (= Strix)
 " carpus (S. coracoid large (carpus smaller))
 " humerus coracoid same in all - humerus same in all
 tarsus-femur tarsus longer - femur shorter (not much)
 " tibia tarsus longer - tibia shorter
 " carpus tarsus longer - carpus shorter (much)
 " humerus tarsus longer - humerus shorter.
 " coracoid tarsus longer - coracoid shorter (much)
 tibia-tarsus tibia shorter - tarsus longer
 " humerus tibia longer - humerus shorter (= S. varia)
 " femur tibia shorter - femur longer (= Strix)
 " carpus tibia longer - carpus shorter (closer to Strix)
 " coracoid tibia about same - coracoid about same
 carpus-tarsus carpus shorter - tarsus longer (S. oc.)
 " tibia carpus shorter - tibia longer (closer to S. Strix)
 " femur carpus shorter - femur longer (Strix)
 " humerus carpus about same - humerus about same
 " coracoid carpus same, coracoid same (coracoid shorter than S. carpus longer than S.)

Tarsus S to S. varia

117.1% = 17% greater

Coracoid S & S. varia

108.2 (8.2% greater)

Femur S to S. varia

111.5 = (11.5% greater)

Tibia S & S. varia

112.2 = 12% greater

Humerus S & S. varia

111.8 = 11.8% greater

Carpometacarpus S & S. varia

111.1 = 11.1% greater

Tarsus S & S. or.

117.8% = 17.8% greater

Corac. S & S. or.

109.8 = 9.8% greater

Femur S & S. or.

117.5 = 17.5% greater

Tibia S & S. or.

119.1 19.1% greater

Humerus S & S. ~~or.~~

112.0 = 12% greater

Carpometacarpus S & S. or.

118.9% = 18% greater

Tarsus S & Bubo

103 = 3% greater

Coracoid S & Bubo

93.5% = 6.5% less

Femur S & Bubo

100% = same

Tibia S & Bubo

94.9% = 5.1% less

Humerus S & Bubo

91.6% = 8.4% less

Carpus S & Bubo

89.8% = 10.2% less

3²³⁸ long by 32 wide

27.6 - 57.3 - 51.9

26.50.3 = 51.7%

23.5 - 44.6 - 52.6%

22.6 - 45.3 - 50.

17.8 35 - 50.6

	max. min.		max. min.		max. min.		max. min.		varia	occidentalis
	B		U		B		O		STR	X
Tarsus	68.0	63.5	63.1	61.1	68.9	61.0	56	56.8	54.6	
Tibia	120.0	112.7	123.2	116.9	133.8	117.9	103.4	98.7	96.6	
Femur	75.4	77.0	78.0	72.1	85.8	74.9	69.7	67.1	65.5	
carpus	59.9	56.2	65.8	61.1	70.3	60.5	52.2	50.3	48.2	
Humerus	121.3	112.5	130.5	121.6	143.3	126.0	104.6	104.0	100.8	
Coracoid	49.3	44.2	51.0	47.4	56.7	49.1	43.2	42.0	41.2	
rostrum	20.7	21.0	20.7	19.2			17.6		16.2	
sternum	27.5		29.5	27.7			26.0	23.4	22.5	
Ratios rel. to cor.										

Tarsus	72.4	69.5	80.8	77.7	82.3	80.5	77	78.8	75.4	✓
Tibia	41.0	37.2	41.3	40.6	42.4	41.6	41.6	42.5	42.5	
Femur	62.5	57.3	65.4	65.8	66.1	65.6	61.8	62.5	62.8	
carpus	82.2	78.6	77.5	77.6	80.8	81.2	82.7	84.1?	85.5	
Humerus	40.5	39.2	39.1	39.0	39.8	38.9	41.3	40.3	40.7	
rostrum	42.1	43.6	40.6	41.3			40.8		39.4	✓
sternum	54.8		53.9	58.5			60.3	55.6	54.7	
Ratios rel. tars										
Femur	86.4	82.3	80.8	84.7	80.4	81.4	86.3	84.8	83.5	
Tibia	56.6	56.4	51.2	52.2	51.5	51.6	54.2	57.5	56.5	
carpus	113.3	113.0	95.8	100.0	97.3	100.7	107.2	143.5?	113.2	
Humerus	56.0	56.3	48.3	50.3	48.1	48.3	53.5	54.7	54.3	
Coracoid	138.0	143.9	123.7	128.9	121.2	124.1	129.9	135.1	132.8	
rostrum	140.5									
Tarsus	56.6	56.4	51.2	52.2	51.5	51.6	54.2	57.5	56.5	
Humerus	101.1	99.9	105.9	104.0	107.1	107	101.1	106	104.1	
Femur	65.5	68.5	63.2	61.7	64.2	63.5	67.4	67.9	67.7	
carpus	49.8	49.7	53.3	52.3	52.5	51.3	50.3	50.6	49.7	
Coracoid	41.0	39.2	41.3	40.5	42.4	41.6	41.7	42.4	42.6	

Set ratios to carpus

84.3 30.7 ~~W. 20.0~~

33.0 Bulb

$$2/1340$$

2/ 11 9 8

6740

59.9

~~In preparation the form is~~

The in actual size S. Brea has been confused with *Bubo virginianus*. When the all the element proportions are considered it is at once apparent that the proportions are different. In this point rel. size of the various elements the resemblance is with *Strix*. Briefly ^{the} ~~the~~ ^{for} ~~the~~ ^{I the genus} ~~the~~ as large as the maximum *Bubo*, and not much averaged approx the same in the two sps. The tibia is 5% smaller than the average for *Bubo*, while the femur is about 10% larger. The humerus & carpalometacarpus are from 8 to 10% smaller than the average for *Bubo*, and the coracoid about 6.5% less than the aver. for *Bubo*. S. Brea with ^{S. varia} ~~the~~ the elements, with the exception of the coracoid ^{& tarsi} ~~are~~ are about the same degree larger in S. Brea, the coracoid appears to be rel. smaller than in either S. varia or S. oc. than in the modern *Strix* and the tarsus is longer, more nearly paralleling S. oc. in its rel to the rest of the skeleton, and the coracoid appears to be rel. smaller than in either S. varia or S. oc.

$$\begin{array}{r} 66.7 \\ 680 \\ 63 \end{array}$$

$$\begin{array}{r} 2 \overline{) 131.5} \\ \underline{65.7} \end{array}$$
[illegible]

E F R H

E 113 9/12-14 ✓ *skin* F 5 ¹³/_{E-11, 12}
 E 2720 ³/_{canal} F 3 132 16 *notum*
 E 9051 ³/_{G-1, 11} F 488 ¹⁶/_{carpo}
 E 9267 ³/_{G-1, 13} F 7438 ¹⁶/_{carpo} G 3933 16 H 4858 16 *coracoid*
 E 9273 *ditto* F 9456 16 G 3957 16 H 4872 16 *coracoid*
 E 9379 ¹⁶/_{12'-16'} *Tarsus type* G 3958 16 H 4889 16 "
 E 9414 ¹⁶/_{17'-20'} *skin* G 3993 67 H 4904 16 "
 E 9416 *ditto* *Tarsus* *whor* G 8421 16 H 4911 16 "
 E 9417 " *Tarsus* *whor* G 8427 16 H 4923 *OK have date*
 E 9425 " *Humerus* *whor* G 8435 28 H 4610 16 *scap*
 E 9439 " *carpomet* H 4613 16 "
 E 9575 ¹⁶/_{12'-14'} *skin* H 4629 16 "
 E 9575 ¹⁶/_{15'-17 1/2'} *Tarsus* H 4636 16 "
 E 9604 ¹⁶/_{13'-6'} *skin* H 4644 16 "
 E 9644 ¹⁶/_{12'-15'} *skin* H 4656 16 *scap*
 E 9647 *ditto* *carpomet* H 4659 16 "
 E 9687 ¹⁶/_{P.D} *coracoid* H 4673 81 "
 E 9758 ¹⁶/_{8-10, 14-15} *skin*
 E 9804 ⁴/_{F 34, 14/2} *Humerus*
 E 9870 ⁴/_{E 5-4, 14'} *ulna*
 E 9888 ⁴/_{D 2-4, 8'} *skin*
 E 9892 ⁴/_{F 4+5 22'-25'} *Tarsus*
 E 9909 ⁴/_{G 3+4, 11 1/2-12 1/2'} *carpomet*
 E 9911 *ditto* *Tarsus*
 E 9919 ⁴/_{canal} *skin*
 E 9932 ⁴/_{B-5, 13'} *skin*
 E 9942 ⁴/_{F 4-5, 12-13'} *skin*

Coracoid

E 9273

E 9687

H 4881

H 4923

H 4904

Bubo 84
466

Length ^a ⁵⁰⁰ ^{left}

cb

ba

44.4

47.4

49.2

48.2

48.9

51.0

47.4

8.7

9.3

9.0

9.1

5.4

5.7

6.7

6.2

6.3

6.6

7.7

7.1

64.4

61.3

74.5

68.0

18.4

19.3

17.6

19.1

74.7

70.9

85.6

77.0

16.1

18.8

13.9

13.0

13.7

13.7

15.0

14.9

length prot c.v. shaft

Tarsometatarsi

G 3957 - 63.7 - 13.4 - 14.7 - 6.0

E 9892 - 65.1 - 13.5 - 15.0 - 6.5

9575 - 66.0 - 13.2 - 15.0 - 6.8

E 9416 - 66.0 - 14.3 - 15.7 - 7.3

E 9911 - 66.1 - 14.6 - 16.5 - 7.2

G 8958 - 66.7 - 13.0 - 14.5 - 6.6

E 9379 - 67.2 - 15.2 - 16.9 - 7.1 TYPE STRUT AREA

G 3933 - 67.6 - 14.6 - 17.0 - 7.4

E 9417 - 68.0 - 14.1 - 16.9 - 7.3